



Kenya Power

TITLE:
SPECIFICATION FOR
INFRARED CAMERA

Doc. No.	KP1/3CB/TSP/09/075
Issue No.	1
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(to be filled and signed by the Supplier and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for past five years, four customer reference letters, details of manufacturing capacity, the manufacturer's experience, copies of complete type test reports and accreditation certificate to ISO/IEC 17025 for the testing laboratory for tender evaluation, all in English Language)

Issued by: Senior Engineer, R&D

Authorized by: Chief Engineer, Tech Stds & Specs

Signed:

Signed:

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0.1 Circulation List

COPY NO.	COPY HOLDER
1	Head of Department, Standards
2	Head of Department, Procurement
Electronic copy (pdf) on Kenya Power server (currently: Network→stima-fprnt-001→techstd&specs)	

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)

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FOREWORD

This specification has been prepared by the Standards Department in collaboration with Network Division both of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for Infrared Cameras. It is intended for use by KPLC in purchasing the cameras.

The bidder shall submit information which confirms satisfactory service experience of the manufacturer with products which fall within the scope of this specification.

1. SCOPE

This specification is for infrared cameras for use on overhead power distribution lines operating at a nominal voltage of upto 66kV and frequency of 50Hz.

The specification also covers inspection and test of the infrared as well as schedule of Guaranteed Technical Particulars to be filled, signed by the manufacturer and submitted for tender evaluation.

The specification stipulates the minimum requirements for infrared cameras acceptable for use in the company and it shall be the responsibility of the supplier to ensure adequacy of the design, good workmanship, good engineering practice and adherence to standards, specifications and applicable regulations in the manufacture of the infrared cameras for The Kenya Power & Lighting Company Ltd.

The specification does not purport to include all the necessary provisions of a contract.

2. REFERENCES

Applicable ISO, IEC and Kenya Standards

3. TERMS AND DEFINITIONS

Terms and Definitions shall be as per the applicable ISO, IEC and Kenya Standards.

4. REQUIREMENTS

- 4.1 The infrared camera shall be industrial type suitable for use along power lines to determine hot spot temperature

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- 4.2 The infrared camera design shall combine great resolution with an optimized field of view to provide brilliant detail and ensure quality images are captured from a safe distance.
- 4.3 The focus system shall ensure that images are in good focus from 1.2 meters (4 feet) and beyond for optimum image clarity and scanning convenience.
- 4.4 The infrared camera shall in addition have the features in Table 1. The references to brand names or catalogue numbers are intended to be descriptive only and not restrictive. The Tenderer may adopt higher standards, brand names, and or catalogue numbers in its Tender, provided that it demonstrates to KPLC's satisfaction that the substitutions ensure substantial equivalence to those designated in Table 1.

Table 1: Infrared Detailed Specifications

DESCRIPTION	REQUIREMENT
IR resolution (FPA size)	80 x 80 Uncooled Microbolometer
Spectral band	9 μm to 15 μm (long wave)
Capture or refresh rate	9 Hz only
NETD (thermal sensitivity)	≤ 0.10°C at 30°C target temp (100 mK)
FOV (field of view)	26° H x 26° V
IFOV (spatial resolution)	5.6 mRad
Temperature measurement range (not calibrated below -10°C)	-20°C to +250°C (-4°F to +482°F)
Temperature measurement accuracy	±2°C or 2% (at 25°C nominal, whichever is greater)
Focus mechanism	Focus free 0.6m (2ft) and beyond
IR-Fusion technology	PIP(1.2m (4ft) to 4.6m (15 ft)) , FULL IR, FULL VISIBLE
Fluke Connect compatible	Yes
Color alarms	None
Standard palettes	Blue-red, grayscale, highcontrast, hot metal, ronbow, amber
Hot/cold markers	Yes
Centerbox (MIN/AVG/MAX)	Yes
Level and span control	Manual and auto

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DESCRIPTION	REQUIREMENT
Minimum span in auto mode	5°C
Minimum span in manual mode	2.5°C
Minimum IR focus distance	122 cm (48 in)
Weight	0.726 kg (1.6 lb)
Size	28.4 x 8.6 x 13.5 cm (11.2 x 3.4 x 5.3 in)
LCD display	3.5 in diagonal (portrait format)
Visible camera	2 megapixel industrial-grade
Minimum automatic parallax correction	~45.7cm(18 in)
Electronic (cardinal) compass	Yes
Emissivity correction	Yes
Transmission correction	Yes
Background (reflected) compensation	Yes
Multi-mode video recording (radiometric .Is3)	Thumbnail review
Memory review	Thumbnail review
Battery (field-replaceable, rechargeable)	Two
Battery life	4+ hours (each) ¹
External battery charging base	required
Charging power supply	Yes
Drop test	2 m (6.5 ft)
Ingress protection (IP) rating (IEC 60529)	IP 54
Recommended calibration cycle	Two-years
Multifunction card reader	Optional (Accessory)
Memory storage	2 GB SD memory card
Direct download capability	Mini USB download direct to PC
Operating temperature range	-10°C to +50°C (14°F to 122°F)
Storage temperature range	-20°C to +50°C (14°F to 122°F)
Operating humidity	Operating and storage 10% to 95%, non-condensing
Vibration and shock	2 G, IEC 68-2-26 and 25 G, IEC 68-2-29
Safety standards	CSA (US and CAN): C22.2 61010-1-04. UL: UL STD 61010-1 (2 nd Edition), ISA 82.02.01
C Tick	IEC/EN 61326-1

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DESCRIPTION	REQUIREMENT
EMI, RFI, EMC	EN61326-1; FCC Part 5
User manuals	Provide in English language
Warranty period	Two-years

4.5. Quality Management System

- 4.5.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the design, material, workmanship, tests, service capability, maintenance and documentation, will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008.
- 4.5.2. The Manufacturer's Declaration of Conformity to reference standards and copies of quality management certifications including copy of valid and relevant ISO 9001: 2008 certificate shall be submitted with the tender for evaluation.
- 4.5.3. The bidder shall indicate the delivery time of the infrared cameras, manufacturer's monthly & annual production capacity and experience in the production of the type and size of camera being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for the infrared cameras sold in the last five years together with reference letters from four of the customers shall be submitted with the tender for evaluation.

5. TESTS AND INSPECTION

- 5.1. Type tests, sampling tests and routine tests shall be done in accordance with applicable ISO, IEC and Kenya Standards and this specification. It shall be the responsibility of the supplier to perform or to have performed all the tests specified.
- 5.2. Copies of Type Test Certificates & Type Test Reports issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate to ISO/IEC 17025 for the testing laboratory shall also be submitted (all in English language).

NOTE: Any translations of certificates and test reports into English language shall be signed and stamped by the third party Testing Laboratory that carried out the tests.

- 5.3. On receipt of the infrared cameras KPLC will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The

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supplier shall replace without charge to KPLC, infrared which upon examination, test or use fail to meet any of the requirements in the specification.

6. MARKING, PACKING AND INSTRUCTIONS

- 6.1 The infrared camera shall be supplied packed in such a manner so as to protect it from damage during transportation, handling and storage and as required in this specification.
- 6.2 Detailed technical and operating instructions and manuals (all in English language) shall be submitted with the bid for evaluation and also during delivery of the infrared camera.
- 6.3 The following information shall be marked indelibly and legibly on each infrared camera:
 - Manufacturer's name or trademark and type designation;
 - Ratings
 - Instructions

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ANNEX A: Guaranteed Technical Particulars (to be filled and signed by the Supplier and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records, four customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of complete test reports for tender evaluation, all in English Language)

Tender No. **BIDDER'S NAME & ADDRESS**

Clause number/Requirement	Bidder's offer (indicate full details of the offered infrared camera for each requirement of the specification)
Name and address of the Manufacturer	
Country of manufacture	
Manufacturer's Letter of Authorization	
Model/Type Reference No. of the offered infrared camera	
Drawing Reference Number	
Manufacturer's warranty and guarantee certificate for the offered infrared camera	
1. SCOPE	
2. APPLICABLE STANDARDS	
3. TERMS AND DEFINITIONS	
4. REQUIREMENTS	
4.1 Infrared camera is the industrial type	
4.2 The design to combine great resolution	
4.3 Focus system to ensure that images are in good focus from 1.2 meters	
4.4 Infrared Detailed Specifications	
IR resolution (FPA size)	
Spectral band	
Capture or refresh rate	
NETD (thermal sensitivity)	
FOV (field of view)	
IFOV (spatial resolution)	
Temperature measurement range (not calibrated below -10°C)	
Temperature measurement accuracy	
Focus mechanism	
IR-Fusion technology	
Fluke Connect compatible	
Color alarms	

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Clause number/Requirement	Bidder's offer (indicate full details of the offered infrared camera for each requirement of the specification)
	Standard palettes
	Hot/cold markers
	Centerbox (MIN/AVG/MAX)
	Level and span control
	Minimum span in auto mode
	Minimum span in manual mode
	Minimum IR focus distance
	Weight
	Size
	LCD display
	Visible camera
	Minimum automatic parallax correction
	Electronic (cardinal) compass
	Emissivity correction
	Transmission correction
	Background (reflected) compensation
	Multi-mode video recording (radiometric .Is3)
	Memory review
	Battery (field-replaceable, rechargeable)
	Battery life
	External battery charging base
	Charging power supply
	Drop test
	Ingress protection (IP) rating (IEC 60529)
	Recommended calibration cycle
	Multifunction card reader
	Memory storage
	Direct download capability
	Operating temperature range
	Storage temperature range
	Operating humidity
	Vibration and shock
	Safety standards
	C Tick
	EMI, RFI, EMC
	User manuals
	Warranty period
4.5	Quality Management System

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Clause number/Requirement		Bidder's offer (indicate full details of the offered infrared camera for each requirement of the specification)
4.5.1	Quality Assurance Plan to be based on ISO 9001:2008	
4.5.2	Declaration of conformity to reference standards Copy of ISO 9001:2008 certificate submitted	
4.5.3	Delivery time of the infrared cameras Monthly & annual production capacity	
5	TESTS AND INSPECTION	
5.1	Responsibility of testing the infrared camera & manufacturer's capability to carry out specified tests	
5.2	Copies of type test reports to ISO/IEC 17025	
5.3	Inspection or test by KPLC during delivery before acceptance to stores	
6	MARKING, PACKING AND INSTRUCTIONS	
6.1	Packing: as per the specification	
6.2	Manufacturer's name or trademark and type designation, Ratings and Instructions to be marked indelibly and legibly on each infrared camera	

.....
Supplier's Name, Signature, Stamp and Date

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Authorized by: Chief Engineer, Tech Stds & Specs

Signed: *[Signature]*

Signed: *[Signature]*

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